ABSTRACT OF THE DISCLOSURE

A novel practicable type of gaseous optical gain medium for efficiently generating intense, highly monochromatic, continuous-wave (CW) or pulsed, coherent light beams is disclosed. Gain results from nonlinear optical pumping of a gas of Λ-type "three-level" atoms, coherently phased ("dressed") via application to the medium of two monochromatic laser beams tuned to the resonance frequencies ω_o and ω_o'. Nonlinear optical pumping of the "dressed-atom" gas is accomplished through the combined action of two separate physical processes: (1) A low pressure gaseous discharge, occurring continuously within the vessel containing the gain medium, produces intense narrow-band fluorescence at ω_o and ω_o' through the process of electron impact excitation (EIE). (2) Via a specific form of the nonlinear photonic process of stimulated hyper-Raman scattering (SHRS), photons comprised by the narrow-band fluorescence generated in (1) are efficiently converted to photons comprised by the propagating coherent light beams at ω_o and ω_o', thus effecting amplification of the latter.